ROOT WILT : A DEFICIENCY DISEASE ?

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The earliest record on the root wilt condition of coconut dates around 1874. The malady became significantly manifested soon after the great flood of 1882 at Erattupettah. In Kerala it now covers 250,000 ha out of a total of about 700, 000 ha under coconut cultivation. (Pillai *et al.* 1973). Distribution and intensity of root (wilt) disease in the different taluks in Kerala State are given in Fig. 1.

Depletion of soil nutrients due to continuous cultivation

The continuous process of cultivating coconut as a monocrop since the early post-vedic period without adopting adequate agronomic practices has made the land unsuitable for optimal production in many cases. An overall reduction in productivity is noticeable (Jayasankar, 1983), especially in Kerala, the traditional coconut grown area where the disease is prevalent.

Susceptibility to infective principle

The capacity of resistance to disease causing organism is lost when the plant is malnutritioned. These factors combined with low pH and stress (water logging or drought) may result in the easy susceptibility of the palm to the attack of fungi or virus or other infective principles (Thampan, 1981). For example greater susceptibility to attack by fungi such as *Pestotiopsis palmarum* (Grey blight) is observed when potassium deficiency occurs (Child, 1974). There is a possibility that a form of bud-rot of coconut palms met with in the New Hebrides may be due to boron deficiency (Fremond, 1965). A suggestion was made that strontium may be involved in the case of Lethal yellowing of coconut palms (Child, 1974).

Southern's (1967) findings are of importance in this context. His description of sulphur deficient palms is like some descriptions of root wilt of Kerala. Sulphur deficiency may be involved (Child, 1974) since one symptom has been the production of rubbery copra (Thampan, 1981) besides general yellowing extending to the young leaves, premature bending of the fronds above the normal abscission layer and diminished production of nuts (Southern, 1969).

The deficiency of calcium and magnesium in the soil plays a decisive role directly or indirectly in causing root wilt. Since Mg is a constituent element of chlorophyll it would be expected that deficiency would be shown by yellowing (Child, 1974). There are complicated interactions such as that of potassium responses to nitrogen or potassium may be restricted when one or the others is in deficiency.

General Symptoms

Main symptoms of root wilt condition described are flaccidity of leaflets accompanied by a bending of the petioles which often turn yellow, and the leaflets showing necrosis of the tip

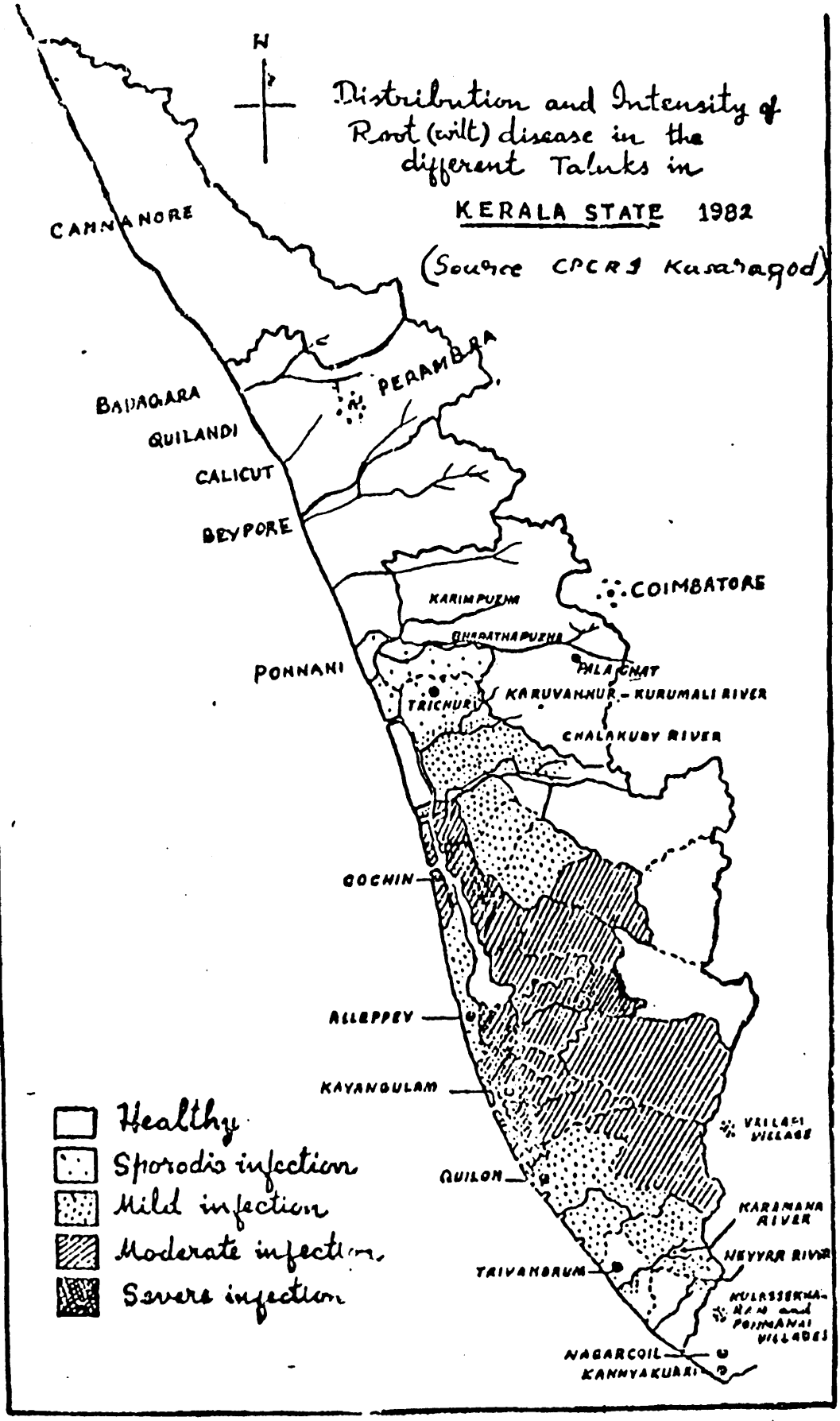

Fig. 1

and margin. Shedding of button nuts and immature nutfall also occur. There is increased dying back of roots in diseased palms (Lal, 1964; Maramorosch, 1964).

Etiological Investigations

Investigations on etiology of the condition have shown constant association of three fungi, *Botryodiplodia theobromea*, *Rhizoctonia solani* and *R. bataticola* with affected roots. Virus like particles and nematodes have also been found associated with root wilt affected plants (Radha, 1974). Pathogenity tests with the above fungi could not produce disease symptoms other than causing root damage (Radha and Menon, 1954). The evidences now available indicate that the disease may be caused by mycoplasma-like organisms (Soloman and Govindankutty, 1983).

In summation, the coconut root wilt malady need not be considered a nightmare. Properly managed plantations are not much affected. Favourable responses

are shown if proper agricultural practices are followed and irrigation is provided. Intercropping with suitable plants also helps to improve the condition of coconut plantation. These give further evidence to malnutrition as the root cause of the phenomena. Thus research is to be directed towards the critical condition or the limiting factor/factors which make the plant susceptible to attack of fungi or virus or other infective principles.

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